

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 25 September 2000 (25.09.00)	
International application No. PCT/US99/28387	Applicant's or agent's file reference 4149-2-PCT
International filing date (day/month/year) 30 November 1999 (30.11.99)	Priority date (day/month/year) 30 November 1998 (30.11.98)
Applicant MIRKIN, Chad, A. et al	

1. The designated Office is hereby notified of its election made:

in the demand filed with the International Preliminary Examining Authority on:

 23 June 2000 (23.06.00)

in a notice effecting later election filed with the International Bureau on:

2. The election was
 was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Henrik Nyberg Telephone No.: (41-22) 338.83.38
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PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION CONCERNING
AMENDMENTS OF THE CLAIMS

(PCT Rule 62 and
Administrative Instructions, Section 417)

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as International Preliminary Examining Authority

Date of mailing (day/month/year) 25 September 2000 (25.09.00)	International filing date (day/month/year) 30 November 1999 (30.11.99)
International application No. PCT/US99/28387	
Applicant NANOSPHERE LLC et al	

The International Bureau hereby informs the International Preliminary Examining Authority that no amendments under Article 19 have been received by the International Bureau (Administrative Instructions, Section 417).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer Henrik Nyberg Telephone No. (41-22) 338.83.38
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 4149-2-PCT	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US99/28387	International filing date (day/month/year) 30 NOVEMBER 1999	(Earliest) Priority Date (day/month/year) 30 NOVEMBER 1998
Applicant NANOSPHERE LLC		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Certain claims were found unsearchable (See Box I).
2. Unity of invention is lacking (See Box II).
3. The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing
 - filed with the international application.
 - furnished by the applicant separately from the international application,
 - but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.
 - transcribed by this Authority.
4. With regard to the title, the text is approved as submitted by the applicant.
 - the text has been established by this Authority to read as follows:
5. With regard to the abstract,
 - the text is approved as submitted by the applicant.
 - the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. The figure of the drawings to be published with the abstract is:
 - Figure No. _____ as suggested by the applicant. None of the figures.
 - because the applicant failed to suggest a figure.
 - because this figure better characterizes the invention.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/28387

A. CLASSIFICATION OF SUBJECT MATTER IPC(6) :G01N 33/553; B32B 5/16 US CL :436/525; 206/569; 428/407 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : Please See Extra Sheet.		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched NONE		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) NONE		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	U.S. 4,023,981 A (PERRONIN et al) 17 May 1977, column 1, lines 41-57; column 3, lines 16-22; column 4, Examples 1-2; column 5, Example 3, column 6, Examples 4-5.	1-7, 26-30
Y	U.S. 4,454,234 A (CZERLINSKI) 12 June 1984, column 2, lines 18-23 and 51-66; column 4, lines 9-16; column 5, lines 33-65; column 7, Examples 1-2; column 8, Example 3; column 9, Example 4.	1-7, 26-30
A	U.S. 4,846,893 A (AKASAKI et al) 11 July 1989.	1-7, 26-30
A	U.S. 5,053,471 A (GOTO et al) 01 October 1991.	70-72
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* *A* *E* *L* *O* *P*	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance earlier document published on or after the international filing date document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) document referring to an oral disclosure, use, exhibition or other means document published prior to the international filing date but later than the priority date claimed	*T* *X* *Y* *&*
Date of the actual completion of the international search 25 FEBRUARY 2000		Date of mailing of the international search report 21 MAR 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230		Authorized officer <i>Fred M. Teskin</i> Fred M. Teskin Telephone No. (703) 308-2456

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/28387

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	U.S. 5,342,909 A (GRUBBS et al) 30 August 1994.	1, 8-14
Y	U.S. 5,639,620 A (SIIMAN et al) 17 June 1997, column 5, lines 6-28; column 6, lines 38-40; column 7, lines 54-60; column 9, lines 39-65; column 10, line 52 to column 11, line 15; column 13, lines 13-43; column 16, lines 18-39; column 20, Example 4; column 26, Example 6; column 28, Example 7.	1-7, 26-30, 54-65
A	U.S. 5,736,413 A (UZAN et al) 07 April 1998.	54-65, 73 - 85
A	U.S. 5,766,764 A (OLLI et al) 16 June 1998.	1-42

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/28387

B. FIELDS SEARCHED

Minimum documentation searched

Classification System: U.S.

206/569; 436/2, 518, 525, 526, 528, 532; 428/407; 523/205, 524/780, 852; 526/241, 281, 309; 556/144, 145;
560/125, 128; 564/454, 455; 568/62, 667

PATENT COOPERATION TREATY

M
00-714-A

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To: WANNELL M. CROOK
SHERIDAN ROSS P.C.
1560 BROADWAY
SUITE 1200
DENVER, CO 80202-5141

PCT

NOTIFICATION OF TRANSMITTAL OF
INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

(PCT Rule 71.1)

Date of Mailing
(day/month/year) **10 JAN 2001**

Applicant's or agent's file reference
4149-2-PCT

IMPORTANT NOTIFICATION

International application No.
PCT/US99/28387

International filing date (day/month/year)
30 NOVEMBER 1999

Priority Date (day/month/year)
30 NOVEMBER 1998

Applicant
NANOSPHERE LLC

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231
Facsimile No. (703) 305-3230

Authorized officer
Fred M. Teskin
B. Handman
Telephone No. (703) 308-2456

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 4149-2-PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US99/28387	International filing date (day/month/year) 30 NOVEMBER 1999	Priority date (day/month/year) 30 NOVEMBER 1998
International Patent Classification (IPC) or national classification and IPC IPC(7): G01N 33/553; B32B 5/16 and US Cl.: 436/525; 206/569; 428/407		
Applicant NANOSPHERE LLC		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets.

This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 0 sheets.

3. This report contains indications relating to the following items:

- I Basis of the report
- II Priority
- III Non-establishment of report with regard to novelty, inventive step or industrial applicability
- IV Lack of unity of invention
- V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI Certain documents cited
- VII Certain defects in the international application
- VIII Certain observations on the international application

Date of submission of the demand 23 JUNE 2000	Date of completion of this report 17 NOVEMBER 2000
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer <i>B. Henden for</i> Fred M. Teskin
Facsimile No. (703) 305-3230	Telephone No. (703) 308-2456

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US99/28387

I. Basis of the report

1. With regard to the elements of the international application:*

- the international application as originally filed
 the description:
 pages 1-38 , as originally filed
 pages NONE , filed with the demand
 pages NONE , filed with the letter of _____
- the claims:
 pages 39-49 , as originally filed
 pages NONE , as amended (together with any statement) under Article 19
 pages NONE , filed with the demand
 pages NONE , filed with the letter of _____
- the drawings:
 pages 1-11 , as originally filed
 pages NONE , filed with the demand
 pages NONE , filed with the letter of _____
- the sequence listing part of the description:
 pages NONE , as originally filed
 pages NONE , filed with the demand
 pages NONE , filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in printed form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages NONE
- the claims, Nos. NONE
- the drawings, sheets/fig NONE

5. This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US99/28387

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. statement

Novelty (N)	Claims <u>1-85</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>1-85</u>	YES
	Claims <u>NONE</u>	NO
Industrial Applicability (IA)	Claims <u>1-85</u>	YES
	Claims <u>NONE</u>	NO

2. citations and explanations (Rule 70.7)

Claims 1-42 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the claimed method of preparing nanoparticles having at least one polymer shell attached thereto or the claimed nanoparticles having initiation monomers attached to them.

Claims 43-53, 66-69 and 83-85 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest propagation, initiation or binding monomers having the formulae as defined in claims 43, 49 and 66, respectively, or the claimed kit for detecting or quantitating an analyte, comprising containers holding types of said binding and said propagation monomers.

Claims 70-82 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a polymer formed by polymerizing one or more types of propagation monomers of the formula as defined in claim 70 or the use of said polymer in the detection or quantitation of an analyte or as a component of a kit therefor.

Claims 54-65 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest use of the claimed nanoparticles in the detection or quantitation of an analyte or as a component of a kit therefor.

Claims 1-85 meet the criteria set out in PCT Article 33(4), because the claimed nanoparticles, polymer and monomer types are industrially useful in assays for detecting or quantitating analytes.

-----NEW CITATIONS-----

NONE

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: WANNELL M. CROOK
 SHERIDAN ROSS P.C.
 1560 BROADWAY
 SUTIE 1200
 DENVER, CO 80202-5141

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

Reviewed:
Date: _____
Initial: _____

Date of Mailing
 (day/month/year) **21 MAR 2000**

Applicant's or agent's file # **4149-2-PCT**
Please return to Janice

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.
PCT/US99/28387

International filing date
 (day/month/year)
30 NOVEMBER 1999

Applicant
NANOSPHERE LLC

1. The applicant is hereby notified that the international search report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
 34, chemin des Colombettes
 1211 Geneva 20, Switzerland
 Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

- the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
- no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 bis 1 and 90 bis 3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the ISA/US
 Commissioner of Patents and Trademarks
 Box PCT
 Washington, D.C. 20231
 Facsimile No. (703) 305-3230

Authorized officer *Jan Rock*
 Fred M. Teskin
 Telephone No. (703) 308-2456

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 15 JAN 2001

WIPO PCT

Applicant's or agent's file reference 4149-2-PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US99/28387	International filing date (day/month/year) 30 NOVEMBER 1999	Priority date (day/month/year) 30 NOVEMBER 1998
International Patent Classification (IPC) or national classification and IPC IPC(7): G01N 33/553; B32B 5/16 and US Cl.: 436/525; 206/569; 428/407		
Applicant NANOSPHERE LLC		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets.

This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 0 sheets.

3. This report contains indications relating to the following items:

- I Basis of the report
- II Priority
- III Non-establishment of report with regard to novelty, inventive step or industrial applicability
- IV Lack of unity of invention
- V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI Certain documents cited
- VII Certain defects in the international application
- VIII Certain observations on the international application

Date of submission of the demand 23 JUNE 2000	Date of completion of this report 17 NOVEMBER 2000
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer <i>F. M. Teskin for</i> Fred M. Teskin
Facsimile No. (703) 305-3230	Telephone No. (703) 308-2456

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US99/28387

I. Basis of the report

1. With regard to the elements of the international application:*

 the international application as originally filed the description:pages 1-38 , as originally filedpages NONE , filed with the demandpages NONE , filed with the letter of _____ the claims:pages 39-49 , as originally filedpages NONE , as amended (together with any statement) under Article 19pages NONE , filed with the demandpages NONE , filed with the letter of _____ the drawings:pages 1-11 , as originally filedpages NONE , filed with the demandpages NONE , filed with the letter of _____ the sequence listing part of the description:pages NONE , as originally filedpages NONE , filed with the demandpages NONE , filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

 the language of a translation furnished for the purposes of international search (under Rule 23.1(b)). the language of publication of the international application (under Rule 48.3(b)). the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

 contained in the international application in printed form. filed together with the international application in computer readable form. furnished subsequently to this Authority in written form. furnished subsequently to this Authority in computer readable form. The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished. The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.4. The amendments have resulted in the cancellation of: the description, pages NONE the claims, Nos. NONE the drawings, sheets/fig NONE5. This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

**Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. statement**

Novelty (N)	Claims <u>1-85</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>1-85</u>	YES
	Claims <u>NONE</u>	NO
Industrial Applicability (IA)	Claims <u>1-85</u>	YES
	Claims <u>NONE</u>	NO

2. citations and explanations (Rule 70.7)

Claims 1-42 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the claimed method of preparing nanoparticles having at least one polymer shell attached thereto or the claimed nanoparticles having initiation monomers attached to them.

Claims 43-53, 66-69 and 83-85 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest propagation, initiation or binding monomers having the formulae as defined in claims 43, 49 and 66, respectively, or the claimed kit for detecting or quantitating an analyte, comprising containers holding types of said binding and said propagation monomers.

Claims 70-82 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a polymer formed by polymerizing one or more types of propagation monomers of the formula as defined in claim 70 or the use of said polymer in the detection or quantitation of an analyte or as a component of a kit therefor.

Claims 54-65 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest use of the claimed nanoparticles in the detection or quantitation of an analyte or as a component of a kit therefor.

Claims 1-85 meet the criteria set out in PCT Article 33(4), because the claimed nanoparticles, polymer and monomer types are industrially useful in assays for detecting or quantitating analytes.

----- NEW CITATIONS -----
NONE